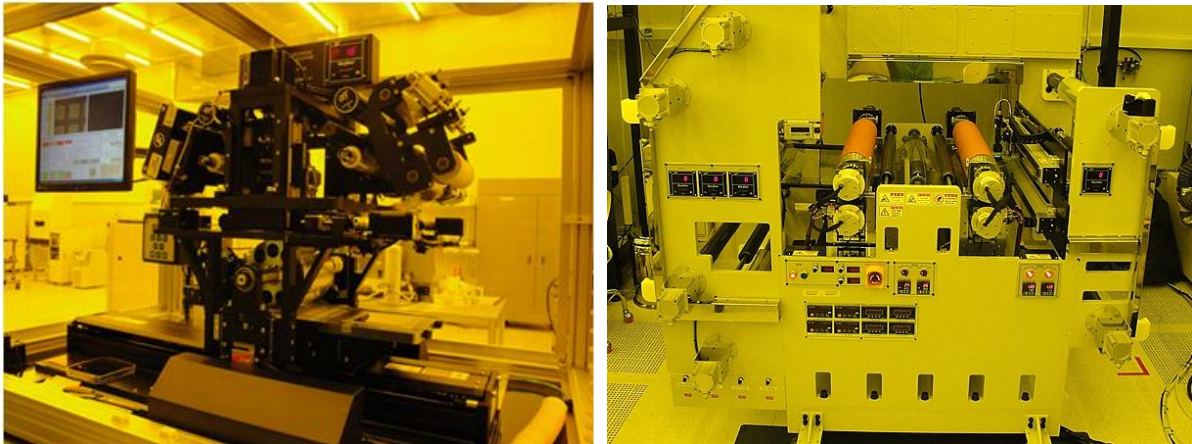


Development of Roll-based Transfer Machine for Flexible Electronic Applications

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There are great needs in flexible and stretchable electronic products with high performance and reliability. Many researchers in academia are considering the transfer technology as a promising candidate for realizing flexible electronic devices with high performances. For industrial use, the transfer technology should demonstrate its throughput as well as its effectiveness. In this talk, we introduce a manufacturing concept for transferring solid thin films onto a polymeric substrate. To resolve the throughput issue, we adopted a roller stamp for transferring brittle thin films. Using the roller stamp with a conformably deformable layer, it is possible to pick the brittle thin films and place them on polymeric substrates with negligible defects. Using the developed systems, single crystalline silicon films of 100 nm thick and monoatomic graphene layers were successfully transferred onto polymeric substrates with large area at a speed of 2 m/min. This result verifies the productivity of the transfer technology equipped with the roller stamp for flexible electronic products.



(a)

(b)

Fig. 1 (a) Plate-to-roll transfer machine, and (b) roll-to-roll transfer machine

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